SYSTEMS AND METHODS FOR SAVING INTERNET CONTENT INTO A
HANDHELD INTERNET APPLIANCE

Field Of The Invention

5   This invention relates generally to systems
and methods for saving Internet content into a handheld
Internet appliance. More specifically, the present
invention provides systems and methods for loading
Internet content into a local database associated with
10   a handheld Internet appliance application.

Background Of The Invention

         The Internet and the World Wide Web
(hereinafter "the web") have revolutionized the ways in
which information is disseminated and shared. At any
15   given time, the Internet enables millions of users
worldwide to simultaneously access a wide variety of
information and engage in activities as diverse as
shopping, playing games, financial trading, among
others.

20   At present, users can access Internet
information through various "Internet appliances",
which are electronic devices configured with an
Internet access system. Internet appliances include,
but are not limited to, microprocessor based devices
25   such as personal and portable computers, and handheld
appliances such as personal digital assistants and

electronic organizers.

Typically, the information is accessed through a connection to a "web page", a multimedia composition that may contain text, audio, graphics, imagery, video, and nearly any other type of content that may be experienced through use of a computer or other electronic device. A web page may also be interactive, and contain user selectable links that cause other web pages to be displayed, forms that may be used by the user to submit information requested in the web page, interactive executable code, or other elements through which the user may interact with web pages. A group of one or more interconnected and closely related web pages is referred to as a "web site".

A web site has a particular address associated with it called a Uniform Resource Locator ("URL"). To view a particular web site, users input its corresponding URL on a "web browser window" displayed by "web browser software", such as Internet Explorer, available from Microsoft Corporation, of Redmond, WA. The web browser software runs on the user's Internet appliance and is responsible for fetching the information displayed on the web site from a "web server" using a transfer protocol such as the HyperText Transfer Protocol ("HTTP").

While most of the traffic on the Internet is initiated from personal computers, the growing demand by mobile business users to have access to Internet information from anywhere in the world has led to the development of various Internet access technologies for handheld Internet appliances such as wireless telephones and personal digital assistants ("PDAs"). In particular, it has become increasingly popular to

access information available in the Internet via PDAs,
such as the Palm handheld devices manufactured by Palm,
Inc., of Santa Clara, CA, the Handspring Visor
manufactured by Handspring, Inc., of Mountain View, CA,
5   and the HP Jornada manufactured by the Hewlett-Packard
Company of Palo Alto, CA.

A PDA provides computing and information
storage and retrieval capabilities for personal or
business use, often for keeping schedule calendars and
10   address book information handy. Information is
accessed by means of an electronically sensitive pad on
which handwriting can be received. Currently available
PDAs contain a number of useful local applications
including an address book, a calendar, a memo pad, a
15   calculator, and a to-do list, among others. Users are
provided with a special pen called a *stylus* to write on
the pad and "tap" on icons on the PDA screen
corresponding to the PDA applications. In addition,
PDA expansion slots may be used to enhance the PDA
20   capabilities with a digital camera, a GPS receiver, a
scanner, and other devices. Recently developed PDAs
such as the PDA Phone manufactured by Samsung
Electronics, Co., Ltd., of Seoul, South Korea, and the
Kyocera QCP 6035 Smartphone manufactured by Kyocera
25   Wireless Corp., of San Diego, CA, combine the
functionalities of a PDA and a wireless phone into a
single handheld appliance.

The Internet is accessed on a PDA by means of
a wireless modem and Internet access software. The
30   wireless modem may either be internally integrated into
the PDA such as in the case of the Palm VIIx,
manufactured by Palm, Inc., or connected externally as
an expansion module. External wireless modems include
the Thinmodem manufactured by Card Access, Inc., of

American Fork, UT, and the various modems manufactured by Novatel Wireless, Inc., of San Diego, CA. The Internet access software may consist of a *microbrowser*, which is a simpler version of a web browser with

5 reduced graphic capabilities, and a variety of APIs (application program interfaces) and associated applications for formatting and displaying web pages on the PDA screen.

There are many advantages in being able to

10 access the Internet with a PDA. The PDA is extremely mobile and can be utilized by business persons and consumers who are traveling or otherwise do not have access to a desktop computer. The PDA enables business persons and consumers to manage, share, and secure the

15 information needed on a daily basis. A PDA user can access the Internet to read e-mails, search for a restaurant, obtain a map and driving directions, purchase airline tickets or shop, all without the need for a traditional, desktop computer.

20 However, accessing the Internet using a PDA has several drawbacks. First, the wireless Internet connection may be unreliable, and the user may have to wait a significant amount of time to receive the requested information. Second, it can be a very time

25 consuming process, requiring users to work through many options in order to access the desired information. Lastly, it can be extremely cumbersome for the user to save the desired information into the PDA.

For instance, a user who is accessing the

30 Internet on a PDA to read e-mail may want to save an e-mail address into the PDA's address book. To save the e-mail address into the address book, the user is required to perform a number of steps, including: (1) connecting to the Internet; (2) starting the e-mail

application to read the e-mail; (3) copying the e-mail address; (4) quitting the e-mail application; (5) starting the address book application; and (6) pasting the e-mail address into the address book.

5   In order to make travel arrangements on-line and save the travel information on the PDA's calendar, the user must first connect to a web site for making travel reservations before starting the calendar application, and then manually enter the departure

10 date, time, location and destination, as well as a return date and time into the calendar. Similarly, a user who is browsing a financial web site to trade stocks and wants to use the PDA's calculator application to compute his financial gains for a

15 particular stock must first connect to the web site to get the stock pricing information before starting the calculator application and manually entering the stock pricing information in the calculator application.

          Alternatively, the user may launch a web site

20 directly from a local application as described in copending, U.S. application No. _____ (OS-003A). The user must still, however, manually select the information from the web site and paste it into the local application. There are currently no mechanisms

25 in place for the user to automatically load Internet content into a handheld Internet appliance and to automatically post Internet content displayed on a web site into another web site. In short, it can be inordinately difficult and time consuming for the PDA

30 user to transfer information from the Internet into local applications in a handheld Internet appliance.

          To address this difficulty, Coola, Inc., of Woburn, MA, has developed a set of APIs and a server technology that enables users to automatically transfer

information from web sites into handheld Internet appliances. The APIs are used to insert user interface buttons on the web sites. When the buttons are pressed by the user, the APIs convert information from the web

5 site into a special format called "coolet". The coolet is sent to a centrally located server before transferring the information into the user's PDA. The information is transferred into the PDA only after the user synchronizes the PDA with a personal computer.

10 While this solution enables users to easily transfer information from web sites into their PDAs, it has the drawback of requiring the user to first synchronize the PDA with a personal computer before the information is transferred into the PDA. Considering

15 that PDAs are a mobile device, users often need to transfer information from web sites into their PDAs while on the road and without access to a personal computer. For example, users on business trips who need to handle a business crisis on the road may need

20 to download information from a web site and transfer the information into a memo pad on the PDA before boarding on an airplane. In this case, the user does not have access to the personal computer and cannot easily transfer the information into the PDA.

25 In view of the foregoing drawbacks, it would be desirable to provide systems and methods for automatically loading information available in the Internet into a local database associated with a handheld Internet appliance application.

30 It further would be desirable to provide systems and methods for automatically transferring information from a web site into a handheld Internet appliance without requiring a user to synchronize the handheld Internet appliance with a personal computer.

It also would be desirable to provide systems and methods for formatting and inserting user interfaces on a web site displayed on a handheld Internet appliance to enable a user to automatically 5 transfer information from the web site into the handheld Internet appliance.

Summary Of The Invention

In view of the foregoing, it is an object of 10 the present invention to provide systems and methods for automatically loading information available in the Internet into a local database associated with a handheld Internet appliance application.

It is another object of the present invention 15 to provide systems and methods for automatically transferring information from a web site into a handheld Internet appliance without requiring a user to synchronize the handheld Internet appliance with a personal computer.

20 It is also an object of the present invention to provide systems and methods for formatting and inserting user interfaces on a web site displayed on a handheld Internet appliance to enable a user to automatically transfer information from the web site 25 into the handheld Internet appliance.

These and other objects of the present invention are accomplished by providing systems and methods for automatically transferring Internet content into a handheld Internet appliance. The systems and 30 methods consist of a software solution that enables web site content to be "active" when displayed on a handheld Internet appliance. The active content can be automatically loaded into local databases associated with handheld Internet appliance applications, or it

can be posted to another web site displayed on the handheld Internet appliance. The web sites are formatted for display on the handheld Internet appliance and include user interfaces to enable users

5 to transfer information from a web site into the handheld Internet appliance applications or into another web site. The information is transferred automatically, without having to wait for users to synchronize the handheld Internet appliance with a

10 personal computer prior to having access to the information.

In a preferred embodiment, the systems and methods of the present invention involve three main software components: (1) a web site API; (2) a software

15 plug-in; and (3) a user interface. The web site API is inserted into each web site from which users may transfer information to their local handheld Internet applications. The API invokes the software plug-in that implements the functions required to automatically

20 load information from a web site into local databases of handheld Internet appliances or into other and to automatically post the information into another web site. The information that can be loaded from a particular web site is defined by the API inserted on

25 that web site. The software plug-in also enables users to launch a web site directly from a local application as described in copending, U.S. application No. _____ (OS-003A). In addition, the software plug-in automatically fills on-line forms on web sites with

30 data stored in local handheld Internet appliance databases as described in copending, U.S. application No. _____ (OS-003B).

In a preferred embodiment, the web site API is referred to as the OneTap™ API, the software plug-in

is referred to as the OneTap™ software plug-in, and the user interface is referred to as the OneTap™ user interface.

Advantageously, the present invention enables
5   users to automatically transfer information from web sites into local handheld Internet appliance databases without requiring users to synchronize the handheld Internet appliance with a personal computer prior to having access to the information.

10 In addition, the present invention inserts user interfaces on web sites displayed on a handheld Internet appliance to enable users to automatically transfer information from the web site into the handheld Internet appliance.

15 Brief Description Of The Drawings

The foregoing and other objects of the present invention will be apparent upon consideration of the following detailed description, taken in conjunction with the accompanying drawings, in which
20 like reference characters refer to like parts throughout, and in which:

FIG. 1 is a schematic view of the system and the network environment in which the present invention operates;

25 FIG. 2 is a schematic view of the software components of the present invention;

FIG. 3 is an illustrative view of the HTML source code of a web page containing the web site API;

FIG. 4 is an illustrative view of the HTML
30 source code of FIG. 3 formatted for display on the handheld Internet appliance;

FIG. 5 is a flowchart for using the systems and methods of the present invention to automatically

save information from a web site into a local database
of a handheld Internet appliance;

FIG. 6 is an illustrative view of menu
options accessible from a web site displaying an
5 address; and

FIG. 8 is an illustrative view of a handheld
Internet appliance screen displaying a web site
containing an address that may be loaded into the
handheld Internet appliance.

Detailed Description Of The Invention

Referring to FIG. 1, a schematic view of the
system and the network environment in which the present
invention operates is described. Handheld Internet
appliance 20 uses a wireless modem and Internet access
15 software to connect to Internet 22 by means of a
wireless network represented by base station 21.
Handheld Internet appliance 20 may consist of a
personal digital assistant (PDA) such as the Palm
handheld devices manufactured by Palm, Inc., of Santa
20 Clara, CA, the Handspring Visor manufactured by
Handspring, Inc., of Mountain View, CA, and the HP
Jornada manufactured by the Hewlett-Packard Company of
Palo Alto, CA. Handheld Internet appliance 20 may also
consist of appliances having the functions of a PDA and
25 a cellular phone, such as the PDA Phone manufactured by
Samsung Electronics, Co., Ltd., of Seoul, South Korea,
and the Kyocera QCP 6035 Smartphone manufactured by
Kyocera Wireless Corp., of San Diego, CA.

Handheld Internet appliance 20 has an
30 electronically sensitive pad and screen on which
handwriting can be received and visualized. Handheld
Internet appliance 20 typically contains a number of
useful local applications including an address book, a

calendar, a memo pad, a calculator, a to-do list, a web
browser, and a word processing application, among
others. Additional software applications such as
games, spreadsheet programs, document processors,

5   dictionaries, and others, may be easily added to
handheld Internet appliance 20. Users are provided
with a special pen called a *stylus* to write on the pad
and "tap" on icons on the screen corresponding to the
available applications. Handheld Internet appliance 20

10 has a main menu to display the application icons to the
user. In addition, expansion slots may be used to
enhance the capabilities of handheld Internet appliance
20 with a digital camera, a GPS receiver, a scanner,
and other devices.

15   To protect the data saved in handheld
Internet appliance 20, a synchronization technology may
be used to synchronize the data from handheld Internet
appliance 20 to a personal computer. Like a personal
computer, handheld Internet appliance 20 has an

20 operating system to manage its applications, input and
output functions and devices, memory sharing, among
other functions. Examples of currently available
operating systems for handheld Internet appliance 20
include the Palm OS, developed by Palm, Inc., and the

25 Windows CE, developed by Microsoft Corporation, of
Redmond, WA.
            Handheld Internet appliance 20 connects to
Internet 22 by means of a wireless modem. The wireless
modem may be internally integrated into handheld

30 Internet appliance 20 such as in the case of the Palm
VIIx, manufactured by Palm, Inc., or connected
externally as an expansion module. External wireless
modems include the Thinmodem manufactured by Card
Access, Inc., of American Fork, UT, and the various

modems manufactured by Novatel Wireless, Inc., of San
Diego, CA. In addition to the wireless modem, handheld
Internet appliance 20 requires Internet access software
to enable users to connect to the Internet. The

5 Internet access software may consist of a microbrowser,
which is a simpler version of a web browser with
reduced graphic capabilities, and a variety of APIs
(application program interfaces) and associated
applications for formatting and displaying web pages on

10 the PDA screen.

     Handheld Internet appliance 20 has software
plug-in 27 to implement the functions required to
automatically load information from web site 23 into
local databases of handheld Internet appliance 20 and

15 to automatically post information from web site 23 into
another web site. In addition, software plug-in 27
enables users to launch a web site directly from a
local application as described in copending, U.S.
application No. _____ (OS-003A), and to fill on-

20 line forms on web sites with data stored in local
handheld Internet appliance databases as described in
copending, U.S. application No. _____ (OS-003B).

     In a preferred embodiment, the web site API
is referred to as the OneTap™ API, the software plug-in

25 is referred to as the OneTap™ software plug-in, and the
user interface is referred to as the OneTap™ user
interface.

     Handheld Internet appliance 20 contains a
number of local databases corresponding to each local

30 application to store the data records entered by the
user. For instance, the address book application of
handheld Internet appliance 20 has a local database
associated with it to store the addresses in the
address book, and the calendar application of handheld

Internet appliance 20 has a local database associated
with it to store the calendar items.

     Users of handheld Internet appliance 20
connect to Internet 22 to access e-mail and various web

5   sites, such as web site 23, that are formatted for
proper display on the screen of handheld Internet
appliance 20. Web site API 24 is inserted into web
site 23 for invoking software plug-in 27 in handheld
Internet appliance 20. Web site API 24 is required for

10 software plug-in 27 to load information from web site
23 into local databases in handheld Internet appliance
20 and to post the information from web site 23 into
another web site. The information from web site 23
that can loaded into handheld Internet appliance 20 or

15 posted to another web site is defined by web site API
24. When a user requests web site 23 on handheld
Internet appliance 20, transcoding server 25 checks web
site 23 to verify the presence of web site API 24.

     Transcoding server 25 also properly formats

20 web site 23 for display by handheld Internet appliance
20. In addition, if web site API 24 is present on web
site 23, transcoding server 25 inserts user interface
26 on web site 23 with links to software plug-in 27.
User interface 26 consists of a button that, when

25 tapped, displays a menu for saving selected information
from web site 23 into a local database in handheld
Internet appliance 20. The menu lists options that may
be selected by the user to save information from web
site 23 into handheld Internet appliance 20. For

30 example, the menu may list an option for saving a
restaurant address displayed on web site 23 into the
address book of handheld Internet appliance 20. Each
item listed on the menu has a link to software plug-in
27 to properly save the information displayed on web

site 23 into a local database in handheld Internet
appliance 20.

Referring now to FIG. 2, a schematic view of
the software components of the present invention is
5   described. The software components consist of: (1) web
site API 24; (2) software plug-in 27; and (3) user
interface 26.

Web site API 24 is inserted into each web
page containing information that may be saved by a user
10   into handheld Internet appliance 20. API 24 invokes
software plug-in 27 to save information from web site
23 into local databases in handheld Internet appliance
20. API 24 also defines the information from web site
23 that can be loaded into the local databases or
15   posted to another web site. For example, in a web site
displaying travel reservations, the API may define the
departure and arrival date and times to be saved into
the local database associated with the calendar
application, and in a web site displaying a restaurant
20   address, the API may define the address to be saved
into the address book application or posted into a web
site that maps the restaurant address. In this case,
the address replaces the parameters in the web site's
URL associated with an address to be mapped.

25   Software plug-in 27 implements the functions
required to automatically transfer information from web
site 23 into local databases in handheld Internet
appliance 20, and to automatically post the information
from web site 23 into another web site. Software plug-
30   in 27 implements the following functions: (1) retrieves
the information from web site 23 to be saved in
handheld Internet appliance 20; (2) formats the
information to be saved according to the local database
to which the information is going to be transferred;

(3) loads the formatted information into a local
database in handheld Internet appliance 20; and (4)
replaces parameters associated with the information on
a web site's URL. In addition, software plug-in 27
5   enables users to launch a web site directly from a
local application as described in copending, U.S.
application No. _____ (OS-003A), and to fill on-
line forms on web sites with data stored in local
handheld Internet appliance databases as described in
10 copending, U.S. application No. _____ (OS-003B).

        User interface 26 lists options that may be
selected by the user to save information from web site
23 into handheld Internet appliance 20. User interface
26 consists of one or more buttons that, when tapped,
15 display a menu for saving information from web site 23
into a local database in handheld Internet appliance
20. For example, the menu may list an option for
saving a restaurant address displayed on web site 23
into the address book of handheld Internet appliance
20 20.

        Referring now to FIG. 3, an illustrative view
of the HTML source code of a web page containing the
web site API is described. HTML source code 28 shows
contact information 29 that may be saved by the user
25 into the address book application. HMTL source code 28
also contains XML code 30 corresponding to web site API
24.

        Referring now to FIG. 4, an illustrative view
of the HTML source code of FIG. 3 formatted for display
30 on the handheld Internet appliance is described. HTML
code 31 is the formatted version of HTML code 28 of
FIG. 3 for proper display on handheld Internet
appliance 20. Upon encountering XML code 28
corresponding to web site API 24, transcoding server 25

formats HTML code 28 to replace XML code 30 with link
32. Link 32 is a link to the appropriate function of
software plug-in 27 to save contact information 29 into
a local database of handheld Internet appliance 20. In

5 case handheld Internet appliance 20 is running the Palm
OS, link 32 consists of a "palmcall". Link 32 also
contains user interface 33, represented by a "Save
Contact" button. When tapped by the user, "Save
Contact" button invokes software plug-in 27 to save

10 contact information 29 into a local database in
handheld Internet appliance 20.

Referring now to FIG. 5, a flowchart for
using the systems and methods of the present invention
to automatically save information from a web site into

15 a local database of a handheld Internet appliance is
described. At step 35, the user launches a web site
displaying information that the user may want to save
into the handheld Internet appliance. For example, if
the user is accessing a web site for making travel

20 reservations, the user may want to save the travel
reservation into the calendar application of the
handheld Internet appliance or send an e-mail to his
secretary with the travel reservation information
included as an e-mail attachment.

25 The web site has a user interface to enable
the user to save the web site content into the handheld
Internet appliance. The user interface consists of a
button inserted on the web site that, when tapped,
displays a menu listing options that may be selected by

30 the user for saving the web site content into the
handheld Internet appliance. For example, the menu may
list a "save address" option for saving an address
displayed on a web site into the local database
associated with the address book application, a "mark

date" option for saving a travel departure date on the
local database associated with the calendar
application, and saving a restaurant address displayed
on web site 23 into the address book of handheld
5   Internet appliance 20.

At step 36, software plug-in 27 retrieves the
information to be saved into a local database in the
handheld Internet appliance. The information may be,
for example, an address, a date, a travel reservation,
10   or any other content displayed on web sites properly
formatted for the handheld Internet appliance. At step
37, the user selects a local application in handheld
Internet appliance 20 for saving the web site content.
For example, if the user is saving an address into the
15   handheld Internet appliance, the user selects an option
in the menu for saving the address into the local
database associated with the address book application.

Referring now to FIG. 6, an illustrative view
of menu options accessible from a web site displaying
20   an address is described. Menu options 41a-d are
displayed in response to a user's tap on a button
provided on a web site displaying an address. The
button is defined by web site API 24 inserted on the
web site's HTML source code. Web site API 24 is also
25   responsible for selecting the address on the web site
that is active for loading into the handheld Internet
appliance.

Menu option 41a enables the user to save the
address displayed to the local database associated with
30   the address book application. Menu option 41b enables
the user to get a map to the address displayed on the
web site. By selecting option 41b, a mapping web site
is displayed on the handheld Internet appliance with a
map to the address selected. The user does not need to

manually enter the address into the mapping web site.
Rather, software plug-in 27 automatically replaces the
address parameters on the mapping web site's URL with
the address selected by the user. Similarly, menu
5   option 41c launches a web site displaying driving
directions to the address selected, while menu option
41d launches a web site displaying commercial locations
that are nearest to the address selected.

Referring now to FIG. 7, an illustrative view
10 of a handheld Internet appliance screen displaying a
web site containing an address that may be loaded into
the handheld Internet appliance or posted to other web
sites is described. Handheld Internet appliance screen
42 is displaying a web site containing address 43 to a
15 coffee shop. A user taps onto a button inserted on the
web site by web site API 24 to open menu 44. Menu 44
enables the user to save address 43 to the address
book, launch a web site to display a map to address 43,
get driving directions to address 43, and find
20 commercial locations near to address 43.

Although particular embodiments of the
present invention have been described above in detail,
it will be understood that this description is merely
for purposes of illustration. Specific features of the
25 invention are shown in some drawings and not in others,
and this is for convenience only and any feature may be
combined with another in accordance with the invention.
Steps of the described processes may be reordered or
combined, and other steps may be included. Further
30 variations will be apparent to one skilled in the art
in light of this disclosure and are intended to fall
within the scope of the appended claims.